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author to relate his work to the rather extensive work done on the differential absorption of ions by plant structures and the resulting changes in the reaction of the substratum.[22] This promises explanation of the corrosive action of roots, their great power to absorb salts from soils, as well as their ability to redden neutral litmus. On account of this process some method other than that used by the author will probably need to be employed for investigating acid secretion in natural growth conditions, in the presence of nutrient solutions or soil. The value of this work as a basis for a general conclusion is doubtful, considering that only two experiments were performed on a single species, and these in an abnormal condition.—WM. CROCKER.

Subantarctic and New Zealand floras.—SKOTTSBERG[23] has continued the series of comparisons made between the floras of portions of the southern hemisphere characterizing the previous work of HOOKER, DIELS, SCHIMPER, WERTH, CHEESEMAN, and CHILTON, and revising the list of bicentric types by taking recent additions to the flora of Subantarctic America and New Zealand into consideration. The list includes 49 orders. These may be referred to groups comprising (1) an Australian and New Zealand element in America, (2) an Andine element in New Zealand and Australia, and (3) an old Antarctic element which is more strictly bicentric. Of the last group *Nothofagus* is a striking example, with 6 species in New Zealand, 1 in Tasmania, 1 in Tasmania and New South Wales, 1 in New South Wales, and 8 in Chili with 3 extending to Fuegia.

He includes some recent evidence from fossil plants found in Graham Land, and concludes that there existed an Antarctic Tertiary flora resembling the present floras of Subantarctic America, New Zealand, and Australia, and that the Antarctic continent may have been a center of evolution from which plants and animals wandered north. The present flora is due therefore to a combination of old wanderings, the extinction of certain species during the Ice Age, the survival of others, and finally transoceanic migrations, which, if they ever took place, are still going on.—GEO. D. FULLER.

Subalpine plants of the Rocky Mountains.—Adding to a series of phytogeographical papers upon the Rocky Mountain region already noted,[24] RYDBERG[25] has analyzed the subalpine flora of the region. It consists of about 800 species, of which only 10 per cent are entirely restricted to the subalpine zone. About 20 per cent of the whole number are transcontinental plants,

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[22] SKENE, M., The acidity of *Sphagnum* and its relation to chalk and mineral salts. Ann. Botany **29**:65–87. 1915.

[23] SKOTTSBERG, CARL, Notes on the relations between the floras of Subantarctic America and New Zealand. Plant World **18**:129–142. 1915.

[24] BOT. GAZ. **62**:83–84. 1916.

[25] RYDBERG, P. A., Phytogeographical notes on the Rocky Mountain region. VI. Distribution of the subalpine plants. Bull. Torr. Bot. Club **43**:343–364. 1916

while another 20 per cent are found also in the Pacific mountains, leaving 60 per cent peculiar to the Rockies. Of these,.fully one-half are restricted to the southern Rockies, and less than one-fourth to the northern Rockies. Of the locally endemic species, which are all herbaceous, 6 are confined to the Canadian Rockies, 3 to Montana, 3 to Idaho, 14 to Wyoming, 13 to Utah, and 16 to Colorado. *Viola biflora* is noted as having the most remarkable distribution, having been found only in a few places in Colorado, in Alaska, and in Europe.—GEO. D. FULLER.

A polycotyledonous bean.—HARRIS[26] has secured a race of the common garden bean which shows steadily more than 2 cotyledons as tested by 3 offspring generations, comprising thousands of individuals. Since the race appears in a "pure line" and has remained constant in several differential features, he concludes that its origin and behavior are characteristic of mutation as defined by DEVRIES. The cotyledons are highly variable in number, ranging from 2 to 7, but have a modal frequency of 4. For this reason the embryo is described as tetracotyledonous. This persistent tendency of a dicotyledonous type to develop polycotyledony is an interesting confirmation of the claim that the number of cotyledons developed depends upon conditions rather than upon inevitable inheritance.—J. M. C.

Illinois Academy.—The volume of *Transactions* of the Illinois Academy of Science for 1915 has just appeared. It contains the following botanical papers: Comparison of a Rocky Mountain grassland with the prairie of Illinois, by GEORGE D. FULLER; Studies in *Phyllosticta* and *Cercospera*, by ESTHER YOUNG; Method of prophesying the life duration of seed, by JAMES E. GROVES; Peculiar examples of plant distribution, by H. S. PEPOON; The grass flora of Illinois, by EDNA MOSHER; A Florida smut, *Ustilago sieglingiae*, in Illinois, by MARGARET MEHLHOP. A symposium on colloids includes the following papers: Outline of the chemistry of colloids, by D. A. MACINNES; Significance of colloidal chemistry in physiology, by WILLIAM CROCKER.—J. M. C.

Bog theories.—The vegetation of peat bogs exhibits such remarkable peculiarities of habit and structure that it has called forth a number of varied and somewhat conflicting explanatory theories. These theories have been summarized carefully by RIGG,[27] especially in so far as the xerophily of the plants is concerned, in a manner that is likely to prove very useful. A good bibliography adds to the value of the paper.—GEO. D. FULLER.

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[26] HARRIS, J. ARTHUR, A tetracotyledonous race of *Phaseolus vulgaris*. Mem. N.Y. Bot. Gard. **6**:229–244. 1916.

[27] RIGG, G. B., A summary of bog theories. Plant World **19**:310–325. 1916.